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AUTHOR	Bass, Randy; Rosenzweig, Roy
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ABSTRACT

This paper discusses the implementation of technology in social studies education. The first section addresses reasons why technology is used in social studies education, including the goal of making the social studies classroom a site of active learning and critical thinking. The second section describes three frameworks for using technology to promote active learning, i.e., inquiry-based learning, bridging reading and writing through online interaction, and making student work public in new media formats. The third section considers things to avoid, including educational software that promotes passivity, school systems' failure to provide professional development for using new technology, and the danger of viewing technology as an end in itself rather than a means to achieving better student learning. The fourth section offers the following recommendations: (1) a renewed national commitment to insuring that the benefits of new technology be shared equally; (2) a revised assessment to accurately measure learning in the new media environment; (3) more tools and supports that will enable teachers to use electronic resources actively and critically; (4) robust professional development programs that will allow teachers to retool for the electronic future; (5) efforts focused on preservice education as well as inservice; and (6) acknowledgment that this country is still at the starting point of the selective appropriation of new technology and that we need serious classroom research into what works is needed. (Contains 30 references.) (MES)

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REWIRING THE HISTORY AND SOCIAL STUDIES CLASSROOM: NEEDS, FRAMEWORKS, DANGERS, AND PROPOSALS[i]

By Randy Bass, Center for New Designs in Learning and Scholarship, Georgetown University, and Roy Rosenzweig, Center for History and New Media, George Mason University

Within five years of Alexander Graham Bell's first display of his telephone at the 1876 Centennial Exposition, *Scientific American* promised that the new device would bring a greater "kinship of humanity" and "nothing less than a new organization of society." Others were less sanguine, worrying that telephones would spread germs through the wires, destroy local accents, and give authoritarian governments a listening box in the homes of their subjects. The Knights of Columbus fretted that phones might wreck home life, stop people from visiting friends, and create a nation of slugs who would not stir from their desks.[ii]

Extravagant predictions of utopia or doom have accompanied most new communications technologies, and the same rhetoric of celebration and denunciation has enveloped the Internet. For *Wired* magazine publisher Louis Rossetto, the digital revolution promises "social changes so profound that their only parallel is probably the discovery of fire." According to Iraq's official government newspaper, *Al-Jumhuriya*, the Internet spells "the end of civilizations, cultures, interests, and ethics."[iii]

The same excessive rhetoric has surrounded specific discussions of computers and education. "Thirty years from now the big university campuses will be relics," proclaims Peter Drucker in *Forbes*. "It took more than 200 years (1440 to the late 1600s) for the printed book to create the modern school. It won't take nearly that long for the [next] big change." One advertisement on the Web captures the mixture of opportunity and anxiety occasioned by the new technology. Three little red schoolhouses stand together in a field. A pulsing green line or wire lights up one of the schools with a pulse of energy and excitement, casting the others into shadow. "Intraschool is Coming to a District Near You," a sign flashes. "Don't Be Left Behind!" And the other side has similarly mobilized exaggerated forecasts of doom. Sven Birkerts, for example, laments new media as a dire threat to essential habits of wisdom—"the struggle for which has for millennia been central to the very idea of culture."[iv]

There are some encouraging recent signs that the exaggerated prophecies of utopia or dystopia are fading and we are beginning the more sober process of assessing where computers, networks, digital media (our working definition of "technology") are and aren't useful. Rather than apocalyptic transformation, we seem to be heading toward what Phil Agre calls the "digestion model." "As a new technology arises," he observes, "various organized groups of participants in

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an existing institutional field selectively appropriate the technology in order to do more of what they are already doing—assimilating new technology to old roles, old practices, and old ways of thinking. And yet once this appropriation takes place, the selective amplification of particular functions disrupts the equilibrium of the existing order, giving rise to dynamics internal to the institution and the eventual emergence of a new, perhaps qualitatively different equilibrium."[v]

In social studies education, we have already begun the process of "selective appropriation" of technology.[vi] But before we can move to a new and hopefully better equilibrium, we need to ask some difficult questions. First, and most important: what we are trying to accomplish? Second, what approaches will work best? Third, are there dangers that we need to avoid as we selectively appropriate new technology into the social studies classroom? Fourth, how can we encourage and support the adoption and development of the best practices?

1. Why Use Technology in Social Studies Education?

Over the past five years of running technology workshops with hundreds, if not thousands, of college and pre-college teachers, we have usually begun by asking them: "What are you doing now in your teaching that you would like to do better? What do you wish your students did more often or differently?" "What pedagogical problems are you looking to solve?" Most commonly, they say they want their students more engaged with learning; they want students to construct new and better relationships to knowledge, not just represent it on tests; and they want students to acquire deeper more lasting understanding of essential concepts.

Such responses run counter to another public discourse about social studies education—the worry, if not alarm, about student knowledge of a body of factual material. "Surely a grade of 33 in 100 on the simplest and most obvious facts of American history is not a record in which any high school can take pride," goes a lament that anyone who follows social studies education will find familiar. Indeed, it should be familiar: this particular quote comes from a study published in the *Journal of Educational Psychology* in 1917. As educational psychologist Sam Wineburg points out, "considering the differences between the elite stratum of society attending high school in 1917 and the near universal enrollments of today, the stability of this ignorance inspires incredulity. Nearly everything has changed between 1917 and today except for one thing: kids don't know any history."[vii] Also unchanged is the persistent worry by school boards and public officials about that seeming ignorance.

And yet based on our own experience, this is not the problem that most concerns those teaching in our classrooms (except insofar as curriculum standards and exams constrain innovation and flexibility); neither is the problem that most concerns those who have studied in those classrooms. In 1994, we undertook a nationwide study of a representative cross-section of 808 Americans (as well as additional special samples of 600 African Americans, Mexican Americans and Sioux Indians) that sought to uncover how Americans use and understand the past. We asked a portion of our sample "to pick one word or phrase to describe your experiences with history classes in elementary or high school." Negative descriptions significantly outweighed positive ones. "Boring" was the single most common word offered. In the entire

study, the words "boring" or "boredom" almost never appeared in descriptions of activities connected with the pursuit of the past, with the significant exception of when respondents talked about studying history in school—where it comes up repeatedly.[viii]

> The same point came across even more sharply when we asked respondents to identify how connected with the past they felt in seven different situations—gathering with their families, celebrating holidays, reading books, watching films, visiting museums or historic sites, and studying history in school. Respondents ranked classrooms dead last with an average score of 5.7 on a 10-point scale (as compared, say, with 7.9 when they gathered with their families). Whereas one-fifth of respondents reported feeling very connected with the past in school (by giving those experiences a rank of 8 or higher), more than two-thirds felt very connected with the past when they gathered with their families. Of course, the comparison we posed is not an entirely fair one. Schools are the one compulsory activity that we asked about; the others are largely voluntary (though some might disagree about family gatherings). Still, our survey finds people most detached from the past in the place that they most systematically encountered it—the schools.

To be sure, these negative comments about classroom-based history were not always reflected in remarks about specific teachers. Respondents, for example, applauded teachers for engaging students in the study of the past through active learning. A North Carolina man in his mid-twenties, for example, praised a teacher who "got us very involved" because she "took us on various trips and we got hands-on" history. A Bronx woman similarly talked enthusiastically about the "realism" of a class project's engagement with an incident in Puerto Rican history: "Everybody had different information about it, and everyone was giving different things about the same thing, so it made it very exciting."

Although teachers could make history classrooms resemble the settings in which, and the ways that, respondents liked to engage the past, most Americans reported that history classrooms more often seemed to include a content that was removed from their interests and to feature memorization and regurgitation of senseless details. Respondents recalled with great vehemence how teachers had required them to memorize and regurgitate names, dates, and details that had no connection to them. They often added that they forgot the details as soon as the exam had ended. Such complaints could be captured in the words of a 36-year-old financial analyst from Palo Alto, California: "It was just a giant data dump that we were supposed to memorize . . . just numbers and names and to this day I still can't remember them."

Not everyone would agree with these complaints. Others would argue that the real problem of the schools is historical and civic illiteracy—a lack of knowledge of the basic facts about history, politics, and society. Our own view (and that of the teachers with whom we have worked) is that such factual knowledge emerges out of active engagement with learning rather than out of textbook and test-driven curriculum. Given that these are contentious issues, we think that it is important to acknowledge our bias up front. The problem we seek to address is the one that preoccupies the teachers with whom we have worked and the survey respondents with whom we talked—how can the social studies classroom become a site of active learning and critical thinking? Can technology foster those goals?

2. What Works? Three Frameworks for Using Technology to Promote Active Learning

The encouraging, albeit anecdotal, news from the field is that technology has, in fact, served those goals for a number of teachers and students across the country and that there is an emerging body of experience that suggests some of the most promising approaches. Our own framework for categorizing and discussing these approaches grows out of our observation of scores of teachers in workshops sponsored by the American Studies Crossroads Project, the New Media Classroom, and the Library of Congress's American Memory Fellows program.[ix] Based on these interactions, we have concluded that the most successful educational uses of digital technology fall into three broad categories:

- **Inquiry-based learning** utilizing primary sources available on CD-ROMs and the World Wide Web, and including the exploration of multimedia environments with potentially fluid combinations of text, image, sound, moving images in presentational and inquiry activities, involving different senses and forms of expression and addressing different learning styles;
- **Bridging reading and writing through on-line interaction**, extending the time and space for dialogue and learning, and joining literacy with disciplinary and interdisciplinary inquiry;
- **Making student work public in new media formats**, encouraging constructivist pedagogies through the creation and exchange of knowledge-representations, and creating opportunities for review by broader professional and public audiences.

Each type of activity takes advantage of particular qualities of the new media. And each type of activity is also linked to particular pedagogical strategies and goals.

Inquiry activities: the novice in the archive

Probably the most important influence of the availability of digital materials and computer networks has been on the development of inquiry-based exercises rooted in the retrieval and analysis of primary social and cultural documents. These range from simple Web exercises in which students must find a photo that tells something about "work" in the late nineteenth-century to elaborate assignments in which students carefully consider how different photographers, artists, and writers historically have treated the subject of poverty. Indeed, teachers report that inquiry activities with digital materials have been effective at all levels of the K-12 curriculum. In Hillsborough, California, for example, middle school students simulate the work of historians by closely analyzing images of children at the turn of the century that can be found on line. They, then, build from that to a semester-long project that asks students to "construct an understanding of the major 'themes' of the period and how these might impact a child born in 1900." To do that they must assemble a physical and digital scrapbook of letters, images, oral histories, artifacts, and diary entries and think critically about those sources.[x] Similarly, fourth graders in New York use the WPA life histories on line at the Library of Congress to reconstruct the worlds of immigrants, and then use photographs from on-line archives to "illustrate" these narratives in

poster presentations. And high school juniors in Kansas City who scrutinize the "Registers of Free Blacks," at the *Valley of the Shadow* Civil War Web site not only to learn about the lives of free African Americans in the Shenandoah Valley before the Civil War, but to reflect on the uses and limitations of different kinds of digital and primary materials to achieve an understanding of the past.[xi]

The analysis of primary sources, and the structured inquiry learning process that is often used in such examinations, are widely recognized as essential steps in building student interest in history and culture and helping them understand the ways that scholars engage in research, study, and interpretation. Primary documents give students a sense of the reality and the complexity of the past; they represent an opportunity to go beyond the predigested, seamless quality of most textbooks to engage with real people and problems. The fragmentary and contradictory nature of primary sources can be challenging and frustrating, but also intriguing and ultimately rewarding, helping students understand the problematic nature of evidence and the constructed quality of historical and social interpretations. Virtually all versions of the national standards for social studies and history published in the 1990s have (in this regard, at least) followed the lead of the 1994 *National Standards for United States History*, which declared that "perhaps no aspect of historical thinking is as exciting to students or as productive of their growth as historical thinkers as 'doing history" by directly encountering "historical documents, eyewitness accounts, letters, diaries, artifacts, [and] photos."[xii]

Of course, the use of primary sources and inquiry methods does not require digital tools. Teachers have long used documentary anthologies and source books (often taking advantage of another somewhat less recent technological advance, the Xerox machine). But the rise of new media and new computer technology has fostered and improved inquiry-based teaching for three key reasons.

First and most obviously is the greatly enhanced access to primary sources that CD-ROMs and the Internet have made possible. Almost overnight teachers, school librarians, and students who previously had scant access to the primary materials from which scholars construct interpretations of society and culture now have at their disposal vast depositories of primary cultural and historical materials. A single Internet connection gives teachers at inner-city urban schools access to more primary source materials than the best-funded private or suburban high school in the United States. Just the sixty different collections (containing about one million different primary documents) that the Library of Congress has made available since the mid-1990s constitute a revolution in the resources available to those who teach about American history, society, or culture. And almost weekly major additional archives are coming on line. These include such diverse collections as the *U.S. Supreme Court Multimedia Database* at Northwestern University (with its massive archive of written and audio decisions and arguments before to the Court); the *U.S. Holocaust Memorial Museum* (with its searchable database of 50,000 images) and *Exploring the French Revolution* at George Mason University (with its comprehensive archive of images and documents).[xiii]

For the history and social studies teacher and the school librarian, even the most frequently criticized feature of the Web—the unfiltered presence of large amounts of "junk"—is potentially an opportunity albeit one that must be approached with care. Bad and biased Web

sites are in the hands of the creative teacher fascinating and revealing primary sources. In effect, many skills traditionally taught by social studies teacher—for example, the critical evaluation of sources—have become even more important in the on-line world. The Web offers an exciting and authentic arena in which students can learn to become critical consumers of information. Equally important, the Web presents the student with social knowledge employed in a "real" context. A student studying Marcus Garvey or Franklin Roosevelt through Web-based sources learns not simply about what Garvey or Roosevelt did in the 1920s and 1930s, but also what these "historical" figures mean to people in the present.

A second appealing feature of this new distributed cultural archive is its multimedia character. The teacher with the Xerox machine is limited to written texts and static (and perhaps poorly copied) images. Now, teachers can engage their students with analyzing the hundreds of early motion pictures placed on line by the Library of Congress, the speeches and oral histories available at the National Gallery of Recorded Sound that Michigan State is beginning to assemble, and with literally hundreds of thousands of historical photographs.[xiv]

Third, the digitization of documents allows students to examine them with supple electronic tools, conducting searches that facilitate and transform the inquiry process. For example, the American Memory Collection provides search engines that operate within and across collections; if one is researching sharecropping in the thousands of interview transcripts held in the Federal Writers' Project archive, a search can quickly find (and take you to) every mention of sharecropping in every transcript. Similarly, searches for key words such as "race" or "ethnicity" turn up interesting patterns and unexpected insights into the language and assumptions of the day. In other words, the search engines cannot only help students to find what they are looking for; they also allow them to examine patterns of word usage and language formation within and across documents.

These kinds of activities—searching, examining patterns, discovering connections among artifacts—are all germane to the *authentic thinking processes* of historians and scholars of society and culture. Digital media not only gives flexible access to these resources but also makes visible the often-invisible archival contexts from which interpretive meaning gets made. "Everyone knows the past was wonderfully complex," notes historian Ed Ayres. "In conventional practice, historians obscure choices and compromises as we winnow evidence through finer and finer grids of note-taking, narrative, and analysis, as the abstracted patterns take on a fixity of their own. A digital archive, on the other hand, reminds us every time we look at it of the connections we are not making, of the complications of the past."[xv]

The combination of increased access with the development of powerful digital searching tools has the potential to transform the nature and the scale of students' relationship to the material itself. For the first time perhaps it allows the novice learner to get into the archives and engage in the kinds of archival activities that only expert learners used to be able to do.[xvi] Of course, the nature of their encounter with primary materials and primary processes is still as novice learners. The unique opportunity with electronic, simulated archives is to create open but guided experiences for students that would be difficult or impractical to recreate in most research library environments. It also frees students and teachers from their traditional dependence on place for

first-hand social, political, or historical research. Or, perhaps more importantly, it means that students can more readily compare their own community with others, more distant.

The task of creating these open but guided experiences is a demanding one. Teachers must not only learn how to use the new technology, but also spend time exploring the digital archives (perhaps in partnership with school librarians) in order to learn what they hold and consider what students can learn from them. The construction of effective inquiry activities demands knowledge of the topic, the documents, and the archive, as well as the craft of introducing students to the inquiry process. Implementing inquiry approaches in the classroom takes considerable class time—time that teachers are sometimes reluctant to give. And the inquiry process is by definition not easy to control; students are likely to come up with unanticipated answers. At their best, however, new media technologies can help make the "intermediate processes of historical cognition" visible and accessible to learners, in part by helping students approach problem-solving and knowledge-making as open, revisable processes, and in part by providing tools to give teachers—as expert learners—a window into student thinking processes.[xvii]

Bridging reading and writing through on-line interaction

One very significant dimension of "making thinking visible," is the bridging of reading and writing through on-line writing and electronic dialogue. Again, the benefits of writing and dialogue for student learning were well established before the emergence of computers and the Internet. Over the last several decades, educators in many disciplines and at every level of education have come to believe that meaningful education involves students not merely as passive recipients of knowledge dispensed by the instructor, but as active contributors to the learning process. One of the key elements in this pedagogy is the importance of student discussion and interaction with the instructor and with each other, which provides opportunities for students to articulate, exchange, and deepen their learning. Educators in a wide range of settings practice variations of this process.

But the emergence of digital media, tools, and networks has multiplied the possibilities. Electronic mail, electronic discussion lists, and Web bulletin boards can support and enhance such pedagogies by creating new spaces for group conversations.[xviii] One of the greatest advantages to using electronic interaction involves the writing process, which can facilitate complex thinking and learning as well as build related skills. These advantages can combine with the potential for electronic discussion to draw out students who remain silent in face-to-face discussion. On-line interaction has also proven to be effective in helping to build connections between subject-based learning and literacy skills (reading and writing) which too often are treated separately.

On-line discussion tools also foster community and dialogue. Active, guided dialogue helps involve students in the processes of making knowledge, testing and rehearsing interpretations, and communicating their ideas to others in "public" ways. Yet another advantage to on-line dialogue tools is in helping students make connections beyond the classroom, whether it is enhancing the study of regional and national history through connections with a classroom elsewhere in the United States, or enhancing global social studies curricula through email "penpal" programs with students elsewhere in the world. Postcard Geography is a simple project,

organized through the Internet, in which hundreds of classes (particularly elementary school classes) learn geography by exchanging postcards (real and virtual, purchased and computer generated) with each other. An Alabama elementary school teacher notes the galvanizing effect of the project on her rural students who "don't get out of their city, let alone their state or country!"[xix] At North Hagerstown High School in Maryland, high school students mount on-line discussions of issues like the crisis in Kosovo, engaging in dialogue among themselves and with more far-flung contributors—from Brooklyn to Belgrade.[xx].

Designing constructive public spaces for learning

Closely connected to both on-line writing and inquiry activities is the third dimension of our framework: the use of constructive virtual spaces as environments for students to synthesize their reading and writing through public products. As with the other uses of new technology, the advantages of public presentations of student work are well known. But, here again, the new technology—in particularly the emergence of the Web as a "public" space that is accessible to all—has greatly leveraged an existing practice. Virtual environments offer many layers of public space that help "make thinking visible" and lead students to develop a stronger sense of public accountability for their ideas. The creation of public, constructed projects is another manifestation of these public pedagogies, one that engages students significantly in the design and building of knowledge products as a critical part of the learning process.

In the use of new media technologies in culture and history fields, "constructivist" and "constuctionist" approaches provide ways for students to make their work public in new media spaces as part of the learning process, ranging from the individual construction of Web pages to participation in large, ongoing collaborative resource projects that involve many students and faculty over many years development.[xxi] For example, at an elementary school in Virginia, fifth graders studying world cultures build a different "wing" of a virtual museum each year, research and annotating cultural artifacts, and then mounting them on line; similarly, at a middle school in Philadelphia sixth graders worked closely with a local museum to create a CD-ROM exhibit on Mesopotamia, using images and resources from the museum's collections.[xxii] Seventh graders in Arlington, Virginia published an on-line "Civil War Newspaper" with Matthew Brady photographs from the Library of Congress as well as their own analyses of the photos.[xxiii] More ambitious student constructed projects can evolve over several years and connect students more closely to their communities as in St. Ignatius, Montana, where high school students have helped to create an on-line community archives.[xxiv]

The power of the digital environment for these kinds of projects comes not merely from their public nature, but from the capabilities of electronic tools for new representations of knowledge in non-linear ways, and through multiple media and multiple voices. Digital tools have the capability to represent complex connections and relationships, as well as make large amounts of information available and manipulable. There is great potential, which we have only begun to understand, in using digital tools for constructionist learning approaches that help students acquire and express the complexity of culture and history knowledge. Student constructionist projects offer a potentially very rich synthesis of resources and expressive capabilities; they combine archival and database resources, with conversational, collaborative, and dialogic tools,

in digital contexts characterized by hypertext and other modes for discovering and representing relationships among knowledge objects.

3. What to Avoid? Hazards Along the Electronic Frontiers

These are all appealing goals and there is some encouraging, although still preliminary, experience to suggest that technology can help us achieve them. But it would be foolish, if not dangerous, to suggest that technology is either a panacea for the problems of social studies education or that any of these approaches is easy to implement. Indeed, the most serious danger from the introduction of technology into the classroom is the mistaken assumption that it, alone, can transform education. The single-minded application of technological solutions to teaching will as surely be as much of a disaster as the application of single-minded solutions to agriculture or forest management. As the first generation of scientific foresters learned, any change in a complex environment needs to be thought about *ecologically*.[xxv] New technologically enhanced approaches—whether inquiry-based learning or student constructionist exercises—must be carefully introduced within the context of existing teaching approaches as well as existing courses and assignments. What assignments are already working well? How will a new assignment alter the overall balance of a course? How do new approaches manifest themselves throughout a curriculum or a school?

By asking these questions, we should be also reminding ourselves to use technology only where it makes a clear contribution to classroom learning. Some teaching strategies, for example, work better with traditional materials. A teacher who has his students post rules of historical significance on butcher paper around the classroom may find that their visual presence is stronger on the classroom walls than on the class Web site. More generally, technology is generally better employed to provide a deeper understanding of some pivotal issues through inquiry and constructionist assignments rather than being pressed into service to respond to standards-based pressures for coverage.

By always thinking about whether new technologies respond to the goals with which we began, we can also be alert to the situations whether technology might operate in the opposite direction from which we intend. Here, it is important to acknowledge that while there are plenty of positive experiences with technology to draw upon, there is also a large body of negative examples that we also need to learn from. The most obvious set of examples can be found in a large body of educational software that promotes passivity rather than the much-promised "interactivity." One of the great advantages of digital media—the ability to incorporate sound and film with text and images—is also one of its greatest problems because of the temptation to turn history into TV commercials in which the media glitz overwhelms sustained contact with difficult ideas. This has been the case with some multi-million dollar multi-media extravaganzas that have been produced that offer multiple interpretations of topics without giving the user any sense of which interpretations are more plausible than others, or without any real level interactivity that encourages active and critical thinking.

Some of these same tendencies were also embodied in the worst of the CD-ROMs that appeared on the market in the early and mid 1990s. In many, the notion of multimedia was a voice reading words that already appeared on the screen. Or, for example, one CD-ROM (that sold for $395) turned out to be a recycled filmstrip—and a twenty-five-year-old one at that.[xxvi] Such uses of digital media are not only going to promote the same deadening memorization of facts that generations of students have complained about but also waste scarce school funds on the products of sleazy educational hucksters.

The pressure of commercial vendors leads to an another related pitfall—the possibility that school systems will invest in equipment, software, and narrowly defined technological training at the expense of funding professional development to use new technology wisely. Computers are expensive, delicate machines that break down often and require recurrent maintenance. The rapid development of the field means that computer labs quickly become outdated. Wiring classrooms for Internet access is expensive and sometimes difficult, particularly in older school buildings. Software can also be costly, and the constant updates required to stay in step with new resources highlights the need for instructional technology staff. Providing effective staff development for teachers throughout the educational system would add significantly to the cost of purchasing hardware. The combined expense of installing, maintaining and supporting the effective use of operative computer labs can be overwhelming. And, as Diane Ravitch rightly points out, "the billions spent on technology represent money not spent on music, art, libraries, maintenance and other essential functions."[xxvii]

Such costs weigh unevenly on different schools, school systems, and communities—another key threat that new technology poses. Under-resourced schools and colleges have a particularly difficult time finding the funds to pay the price required for new technology. While federal, state, and corporate grant programs are helpful, they are not sufficient; and they usually pay only for hardware, not for maintenance or staff development. As a result, the schools and colleges serving poor and working-class communities lag behind in the effective implementation of technology. And their students—disproportionately African American or Latino—are the ones that suffer most. According to the most recent report from the National Center for Education Statistics, 51% of public school classrooms nationwide have Internet access. But for schools with large numbers of poor or minority students, the number drops to less than 40%. This disparity shapes colleges and universities as well. While 80.1% of all students entering elite private colleges report they use computers regularly, only 41.1% percent of students entering historically black colleges report similar usage. In many colleges, students who come from under-resourced school systems will find technology to be one more item to be added to an already-daunting list of educational and social challenges. There is a real—and in many ways a growing—threat that new technology will add to the already immense nationwide stratification of educational opportunity. Indeed, the most recent national report on the "digital divide" indicates that technology use continues to split along lines of both class and race.[xxviii] And the problem is even worse when considered internationally.

Finally, there is the larger danger that educators, parents, and school boards come to see technology as an end in itself rather than a means to achieving better student learning.

Technology can act as a powerful narcotic that lulls us into believing that we are teaching students to think simply by putting machines into classrooms. The hardest intellectual and pedagogical problems—teaching students to judge the quality of information, to deal with conflicting evidence, to develop analytical frameworks—are present in both the print and digital environments.

4. What Next? Toward Student Learning

Not surprisingly, our recommendations for the future grow out of our experience with this new (but by now decade long) history of digital technology in the social studies classroom.

First, we would urge a renewed national commitment to insuring that the benefits of new technology be shared equally. Many others have made the same point, and there is little need for us to belabor it here.

Second (and while we are still tilting at windmills), we would argue that assessment needs to be revised to accurately measure learning in the new media environment. Right now, standards and assessment tend to hinder the integration of technology into teaching. When assessment, as in most states, requires pre-twentieth-century technology (i.e., pen and paper) and is focused on content and factual knowledge, teachers are understandably reluctant to adopt strategies that take advantage of the potential of technology to promote deeper understanding. But if the assessment were designed to reflect deeper understanding of reading, interpreting and arguing processes as well as what students need to know in the twenty-first century—including how to use the Internet and computers to research, analyze, and present information—then the integration of technology into the social studies and other academic curricula would be greatly fostered.

Third, we think that teachers need more tools and supports that will enable them to use electronic resources actively and critically. Teachers value gateway sites because they provide reliable starting points, filtering mechanisms, and sample curricula for using the Web.[xxix] In addition, since many teachers are themselves relative novices in the archives, they need guides to evaluating and analyzing primary source materials. They also need the kinds of software tools that allow their students to collaborate electronically with ease. And they need access to software and hardware that makes student constructionist projects feasible in multiple settings. Such software environments need to remain open and flexible, and not "one-size fits all" templates that presuppose certain teaching styles or approaches.

Fourth, teachers need robust professional development programs that will allow them to retool for the electronic future. The billions of dollars invested in "preparing schools for the twenty-first century" have gone (and continue to go) overwhelmingly to hardware and wiring. Where teachers lack necessary training and support, computer labs frequently wind up gathering dust, or being used as glorified typing labs. We would argue that meaningful progress in this field requires that funding for professional development must be given equal priority with funding for hardware. But it is not simply a matter of the quantity of available faculty development; it is also

a question of quality. Typically, professional development in technology focuses narrowly on building technology skills or familiarizing teachers with particular software applications. The most common faculty development structure is a two to four hour workshop led by technology support staff who are skilled in technical issues but relatively distant from the latest thinking about disciplinary content and teaching methodology. Our experience and feedback from our colleagues suggests the importance of developing a different approach.

In particular, we would encourage leaders in the field to create, nurture and support professional development approaches that are deeply rooted in the issues and experiences of everyday classroom practice and build directly on teacher's expertise teaching in non-technological settings, and models ways to adapt their skills to a new context. They need to speak to real classroom needs, helping teachers to find ways to use technology to solve long-standing problems, do their work better, and more effectively reach their goals for their courses and their students. And they must point teachers towards classroom implementation, testing and experimentation with real students in real classroom situations. In addition, professional development needs to involve *a sustained and recursive process.* Instead of one-shot workshops, effective professional development with technology must unfold over time and provide multiple opportunities for teachers to move back and forth between initial training workshops, classroom testing, and reflective seminars where they can articulate and collectively analyze their experiments using new technology resources.

Such approaches will themselves benefit from the effective uses of technology. One of the most exciting things that the Internet has brought to teachers has been the erosion of the isolation that traditionally afflicts the classroom teacher. The teachers with whom we have worked in Crossroads, the New Media Classroom, and the American Memory fellows program have acquired a much broader set of colleagues than was ever possible before. On a regular basis they consult with each other on how to teach a particular subject or to organize a particular assignment. Other teachers have developed mutually supportive relationships with teachers across the country who they have never met but with whom they converse through lists like H-High, H-Teach, the "Talking History" forums sponsored by *History Matters*, or "Highroads" sponsored by Crossroads. In some of these settings, the high school teacher in Kansas City can get advice on the latest developments in women's history from a leading scholar like Gerda Lerner or they can find out about successful assignments from an award-winning high school teacher from Virginia. The often-chaotic information environment of the Web also encourages teachers to forge partnerships with school librarians, who can bring particular skills in information evaluation to the table.

Fifth, given the difficulty of altering entrenched patterns of professional development, it makes sense to focus efforts on pre-service education as well as in-service. Such efforts—as manifest in education curricula and state certification requirements—need to go considerably beyond courses on new media and teaching methods. Future teachers most need discipline-based courses in which technology is integrated into the course content. Such courses can enable teachers to understand the archive-at-a-mouse-click not as some new way to bring the library to the doorstep, but as a fundamental shift in how society handles knowledge, its accessibility, and

what one can do with it. Moreover, teachers will never make effective use of the vast archives now accessible to them unless they understand, for example, the nature of historical evidence and argumentation or other disciplinary contexts for using new media.[xxx] More generally, the educating of teachers to use technology effectively must go far beyond simple training in software or techniques for implementation to include an initiation into habits of reflective practice that will allow them to adapt and innovate in new learning environments throughout their careers, even as specific technologies and applications change.

Sixth, we need to acknowledge that we are still at the starting point of the selective appropriation of new technology and that we need serious classroom research into what does and doesn't work. Some of this research needs to come from professional educational researchers. But we also believe that research can be combined with professional development where the teacher becomes the researcher. The approaches that have begun to emerge on the college level under the rubric of the "scholarship of teaching," and are beginning to be explored on the pre-college level as well.

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But whatever approaches are taken we need to return continually to first principles and ask ourselves: what are we trying to accomplish in the classroom? Can technology help to make that possible? One way to keep that mantra in mind is to recall the old joke about a man who works in a factory and leaves there every evening with a wheelbarrow full of straw. Every night as he exits the factory and passes through the gate, the guard looks through the straw, certain that the man is stealing something. At the end of twenty years employment, the man is departing, as always with his wheelbarrow full of straw. The guard turns to the man and says:

> "For twenty years you have been leaving every night with a wheelbarrow full of straw. For twenty years, every night, I look through the straw and find nothing. I know you have been stealing something. This is your last night. For my own curiosity, you have to tell me: what have you been stealing all these years?"

The man replied, "Wheelbarrows." If that joke were taken as an analogy, then technology is the straw. It is merely the prop by which we are getting something more valuable (the wheelbarrow) out the door. And what are the more valuable things we're trying to get out the door? They are, we would argue, the enhancement of learning through interaction and dialogue; an increasingly expansive, inclusive, and socially conscientious approach to the study of history, society, and culture; and the elevation of our standards for what passes as student learning.

ENDNOTES

[i] Some of the material in this paper was drawn from "Teaching Culture, Learning Culture, and New Media Technologies," by Randy Bass and Bret Eynon, an introductory essay for the volume, "Intentional Media. The Crossroads Conversations on Learning and Technology in the American Culture and History Classroom," *Works & Days* Spring/Fall 1998. The authors are indebted to Bret Eynon, Deputy Director of the American Social History Project/Center for Media and Learning, both for his contributions to the earlier text and, more significantly, to the ideas behind this paper, which are in large ways the product of his collaborations. We also want to thank the following for helpful comments on and suggestions for this paper. Debbie Abilock, Mike Alcoff, Marta Brooks, Donlan, John Elfrank-Dana, Kathy Isaacs, Frances Jacobsoen, Dawn Jaeger, Ron Stoloff, Carl Schulkin, Peter Seixas, Bill Tally, Eileen Walsh, and Sam Wineburg.

[ii] Quotes from 1880 and 1881 *Scientific American* in Steven Lubar, *InfoCulture. The Smithsonian Book of Information Age Inventions* (Boston, 1993), 130, and Claude S Fischer, *America Calling A Social History of the Telephone to 1940* (Berkeley, 1992), 2 (see also pp 1 and 26) Carolyn Marvin, *When Old Technologies Were New Thinking about Electrical Communication in the Late Nineteenth Century* (New York, 1988) and Graham Rayman, "Hello, Utopia Calling?" in *Word* (no date) at http://www.word.com/machine/jacobs/phone/index.html

[iii] Rossetto quoted in David Hudson, *Rewired A Brief and Opinionated Net History* (1997), 7; Al-Jumhuriya in R J Lambrose, "The Abusable Past," *Radical History Review* 70 (1998) 184.

[iv] Robert Lenzner and Stephen S. Johnson, "Seeing Things as They Really Are," *Forbes* (March 10, 1997), available on line at http://www.forbes.com/forbes/97/0310/5905122a.htm; Birkerts in "The Electronic Hive Two Views:" "Refuse It" (Sven Birkerts) and "Embrace It" (Kevin Kelly), *Harper's Magazine* (May 1994) See also Sven Birkerts, *The Gutenberg Elegies The Fate of Reading in an Electronic Age* (1994); Todd Oppenheimer, The Computer Delusion," *Atlantic Monthly* (July 1997).

[v] Philip E. Agre, "Communities and Institutions The Internet and the Structuring of Human Relationships," circulated through Red Rock Eater's News Service, copy available at http://www.egroups.com/group/rre/804.html?

[vi] Readers will note that many of our references here are to the teaching of history and American culture, since those are our own specialties, but we think that our arguments apply broadly to social studies.

[vii] Sam Wineburg, "Making Historical Sense," in Peter Stearns, Sam Wineburg, and Peter Seixas, eds., *History Education in a National and International Context* (forthcoming NYU Press). On the question of factual knowledge, the most influential study of recent years has been Diane Ravitch and Chester Finn Jr., *What Do Our 17-Year-Olds Know? A Report on the First National Assessment of History and Literature* (New York Harper & Row, 1987) There is a large literature debating the work of Ravitch and Finn. See, for example, William Ayers, "What Do 17-Year-Olds Know? A Critique of Recent Research," *Education Digest* 53 (Apr, 1988) 37-39; Dale Whittington, "What Have 17-Year-Olds Known in the Past?" *American Educational Research Journal* 28 (Winter 1991) 759-80; Deborah Meier and Florence Miller, "The Book of Lists," *Nation*, 245 (Jan 9, 1988) 25-27; Terry Teachout, "Why Johnny is Ignorant," *Commentary* (March 1988), 69-71. There have been two more recent studies by the National Assessment of Education Progress (NAEP For brief reports on these, see Michael Mehle, "History Basics Stump U.S Kids, Study Finds," *Bergen Record*, April 3, 1990, A1; Carol Innerst, "History Test Results Aren't Encouraging; US Teens Flop on 'Basic' Quiz," *Washington Times*, November 2, 1995, A2.

[viii] Roy Rosenzweig and David Thelen, The *Presence of the Past Popular Uses of History in American Life* (1998); see also http://chnm.gmu.edu/survey.

[ix] For Crossroads, see http://www.georgetown.edu/crossroads/; for New Media Classroom, which is co-sponsored by American Social History Project/Center for Media & Learning (ASHP/CML) in collaboration with the American Studies Association's Crossroads Project, see http://www.ashp.cuny.edu/index_new.html; for American Memory Fellows, see http://memory.loc.gov/ammem/ndlpedu/amfp/intro.html

[x] See http://www.nueva.pvt.k12.ca.us/~debbie/library/cur/20c/turn.html

[xi] For WPA life histories, see http://lcweb2.loc.gov/ammem/ndlpedu/lesson97/firsthand/main.html.; for use of free black registers, see http://historymatters.gmu.edu/text/3freeblacks-shulkin.html

[xii] National Center for History in the Schools, *National Standards for United States History Exploring the American Experience* (1994), 29.The new American Association of School Librarians standards for student learning similarly focus on information literacy, on the ability to find, select, analyze, and interpret primary sources See "Information Power The Nine Information Literacy Standards for Student Learning" at http://www.ala.org/aasl/ip_nine.html

[xiii] The Oyez Project, Northwestern University, *U.S Supreme Court Multimedia Database* http://oyez.nwu.edu/; the *U.S. Holocaust Memorial Museum* at http://www.ushmm.org/ *Liberty, Equality, Fraternity Exploring the French Revolution* is being developed by the Center for History and New Media at GMU and the American Social History Project at CUNY and will be available in early 2000 at http://chnm.gmu.edu/revolution. For a discussion of history Web sites, see Mike O'Malley and Roy Rosenzweig, "Brave New World or Blind Alley? American History on the World Wide Web," *Journal of American History* (June 1997), 132-155.

[xiv] Library of Congress, *Inventing Entertainment the Early Motion Pictures and Sound Recordings of the Edison Companies* at http://memory.loc.gov/ammem/edhtml/edhome.html For plans for National Gallery of Recorded Sound, see http://www.h-net.msu.edu/about/press/ngsw.html.

[xv] Ed Ayres, "The Futures of Digital History," unpublished paper delivered at the Organization of American Historians, Toronto, April 1999 (copy in possession of authors).

[xvi] On the "novice in the archive," see Randy Bass, "Engines of Inquiry Teaching, Technology, and Learner-Centered Approaches to Culture and History," in American Studies Crossroads Project, *Engines of Inquiry A Practical Guide for Using Technology in Teaching American Culture* (1997), which can be ordered from http://www.georgetown.edu/crossroads

[xvii] Sam Wineburg, "The Cognitive Representation of Historical Texts," in G. Leinhardt, I. L. Beck, and C.Stanton, eds., *Teaching and Learning in History* (1994), 85. See also Allan Collins, John Seeley Brown, and Ann Holum, "Cognitive Apprenticeship Making Thinking Visible," *American Educator* (Winter 1991), 6-11, 38-46.

[xviii] At the collegiate level, some of the greatest advantages to using electronic interaction is that it increases the amount of time that students are focused on and interacting about the subject. Another advantage is the opportunity for "asynchronous" discussion students can engage in the conversation on their own schedule, rather than only at the time when the instructor and other students are available. These uses are less pertinent at this time for the K-12 context than other benefits of on-line interaction that we describe.

[xix] See http://www.internet-catalyst.org/projects/PCG/postcard.html

[xx] See http://www.fred.net/nhhs/html/newspage.html

[xxi] *Constructivism* implies a theory of learning that emphasizes the active creation of knowledge by the learner, rather than the imparting of information and knowledge by the instructor. *A* second meaning for constructivism, sometimes also called *constructionism*, is the extension of constructivist approaches that stresses the building of knowledge objects, "Constructionism," as defined by Yasmin Kafai and Mitchel Resnick, "suggests that learners are particularly likely to make new ideas when they are actively engaged in making some type of external artifact which they can reflect upon and share with others." Kafai and Resnick, *Constructionism in Practice Designing, Thinking, and Learning in a Digital World* (1996), 1.

[xxii] http://www.fcps.k12.va.us/VirginiaRunES/museum/museum.htm Daniel Sipe Presentation at NMC, New York, July 1997

[xxiii] See http://www.wms-arl.org/amf1/student.htm

[xxiv] See http://206.252.235.34/projects/local.htm For a taxonomy of student constructive projects, with links to school and college-based examples, see http://www.georgetown.edu/crossroads/constructive.html

[xxv] On the problems of scientific forestry, see James Scott, *Thinking Like a State How Certain Schemes to Improve the Human Condition Have Failed* (1998), 11-22.

[xxvi] On history CD-ROMs, see Roy Rosenzweig, "So, What's Next for Clio?" CD-ROM and Historians," *Journal of American History* (March 1995), 1621-1640.

[xxvii] Diane Ravitch, "The Great Technology Mania," Forbes (March 23, 1998), available on line at http://www.forbes.com/forbes/98/0323/6106134a.htm

[xxviii] U.S Department of Education, National Center for Education Statistics , "Internet Access in Public Schools and Classrooms 1994-98," February 1999, available on line at http://nces.ed.gov/pubs99/1999017.html See also National Telecommunications and Information Administration, U.S Department of Commerce, *Falling Through the Net Defining the Digital Divide* (July 1999), available at http://www.ntia.doc.gov/ntiahome/digitaldivide/ and Paul Attewell and Juan Battle, "Home Computers and School Performance," *The Information Society* 15:1 (1999), which finds that students with computers at home have higher test scores even after controlling for family income but that children from high socio-economic (and white) homes show larger educational gains with home computers than do lower SES (and minority) children

[xxix] For two examples of gateways see *American Studies Electronic Crossroads* (http://www.georgetown.edu/crossroads/) and *History Matters The U.S Survey Course on the Web* (http://historymatters.gmu.edu)

[xxx] See Sam Wineburg, "Historical Thinking and Other Unnatural Acts," *Phi Delta Kappan*, 80 (March 1999) 488-99.